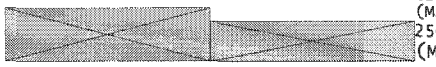
Figure 12A

HP TURBINE RETROFIT
DERIVATION OF HP SECTION EFFICIENCY AND SHAFT POWER
(FINAL FEEDWATER EXTRACTION FROM AFTER HP STAGE 5)



2256 lb/h to SSR
(M2)
2561 lb/h to Hot Reheat
(M3)

17115 lb/h
651.1 psia (M4)
639.4 °F
1310.8 Btu/lb (H4)
(H6)
1461.1 Btu/lb
To IP Rotor Cooling
651.1 psia
1310.6 Btu/lb HP TURBINE
6,900,000 lb/h (M1)
2400 psig
1000 °F
1461.1 Btu/lb (H1)

HP TURBINE SHAFT POWER
2342.3 psia
1461.1 Btu/lb

568030 lb/h (M5)
1091.2 psia
772.4 °F
1367.0 Btu/lb (H5)
Volumetric flow 96.7 ft³/sec
To Final Feedwater Heater
(Final feedwater temperature 554.6°F)

These data are provided for information only.

Unit Output = 982467 kw
Unit heat rate = 7569 Btu/kWh

HP TURBINE SHAFT POWER
(1% Feedwater make-up assumed)

$$= \frac{(M1-M2-M3) \times (H1-H6) - M4 \times (H4-H6) - M5 \times (H5-H6)}{3412.14 \times 1000}$$

= 293.6 MW

IP7010601

HP TURBINE EFFICIENCY
including Valves
(1997 Steam Tables)

$$= \frac{H1 - H6}{H1 - H6'} \times 100 = 92.4\ \%$$